SAMSUNG

ELECTRONICS

Approval

LEAD-FREE

TO   :

DATE   : Apr. 15, 2008

SAMSUNG TFT-LCD

MODEL NO. : LTN141AT06

NOTE : Extension code [-001]
                → LTN141AT06-**001**
           Surface type [**Anti-Glare**]

The information described in this SPEC is preliminary and can be changed without prior notice.

APPROVED BY :   *K. H. Shin*

PREPARED BY :   *Jay Kim*

SAMSUNG ELECTRONICS CO., LTD.

wise view™

Samsung Secret

| Doc.No. | LTN141AT06 | Rev.No | 04-A00-G-080415 | Page | 1 / 31 |

Approval

CONTENTS

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	2 / 31

Approval

GENERAL DESCRIPTION

DESCRIPTION

LTN141AT06 is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as switching devices. This model is composed of a TFT LCD panel, a driver circuit and a backlight unit. The resolution of a 14.1" contains 1280 x 800 pixels and can display up to 262,144 colors. 6 O'clock direction is the optimum viewing angle.

FEATURES

- High contrast ratio, high aperture structure
- WXGA (1280 x 800 pixels) resolution
- Low power consumption
- Fast Response
- LED Back Light with LED Driver
- DE(Data enable) only mode
- 3.3V LVDS Interface
- Onboard EEDID chip
- Green product (RoHS compliance)

APPLICATIONS

- Notebook PC
- If the usage of this product is not for PC application, but for others, please contact SEC

GENERAL INFORMATION

Item	Specification	Unit	Note
Display area	303.55(H) x 189.72(V) (14.1" wide diagonal)	mm	
Driver element	a-Si TFT active matrix		
Display colors	262,144		
Number of pixel	1280 x 800	pixel	
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.2370(H) x 0.2370(V) (TYP.)	mm	
Display Mode	Normally white		
Surface treatment	Haze 25, Hard-Coating 3H		

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	3 / 31

Approval

Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal (H)	319.0	319.5	320.0	mm	
	Vertical (V)	206.0	206.5	207.0	mm	
	Depth (D)	-	5.2	5.5	mm	(1)
Weight		-	350	360	g	

Note (1) Measurement condition of outline dimension
　　　　　　. Equipment : Bernier Calipers
　　　　　　. Push Force : 500g ·f (minimum)

1. ABSOLUTE MAXIMUM RATINGS

1.1 ENVIRONMENTAL ABSOLUTE RATINGS

Item	Symbol	Min.	Max.	Unit	Note
Storage temperate	TSTG	-20	60	$^\circ$C	(1)
Operating temperate (Temperature of glass surface)	TOPR	0	50	$^\circ$C	(1)
Shock (non-operating)	Snop	-	240	G	(2),(4)
Vibration (non-operating)	Vnop	-	2.41	G	(3),(4)

Note　(1) Temperature and relative humidity range are shown in the figure below.
　　　　　　95 % RH Max. (40 $^\circ$C $\geq$ Ta)
　　　　　　Maximum wet - bulb temperature at 39 $^\circ$C or less. (Ta > 40 $^\circ$C) No condensation

Relative Humidity (%RH)

(40,90)

Operating Range

(50,50.4)

(60,27.7)

Storage Range

Temperature ($^\circ$C)
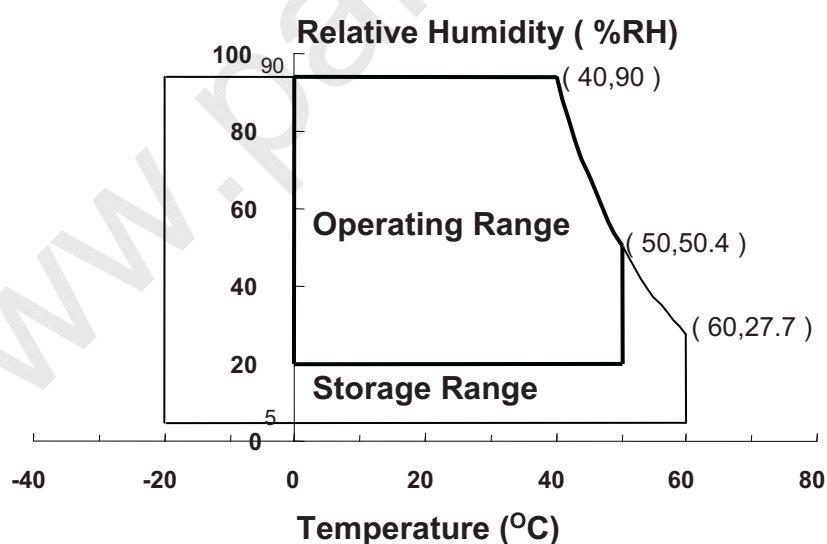
(2) 2ms, half sine wave, one time for ±X, ±Y, ± Z.
(3) 5 - 500 Hz, random vibration, 30min for X, Y, Z.
(4) At testing Vibration and Shock, the fixture in holding the Module to be tested have to be
　　 hard and rigid enough so that the Module would not be twisted or bent by the fixture.

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	4 / 31

Approval

1.2 ELECTRICAL ABSOLUTE RATINGS

(1) TFT LCD MODULE

V_{DD} =3.3V, V_{SS} = GND = 0V

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{DD}	V_{DD} - 0.3	V_{DD} + 0.3	V	(1)
Logic Input Voltage	V_{IN}	V_{DD} - 0.3	V_{DD} + 0.3	V	(1)

Note (1) Within Ta (25 ± 2 °C)

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	5 / 31

Approval

2. OPTICAL CHARACTERISTICS

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note (5).
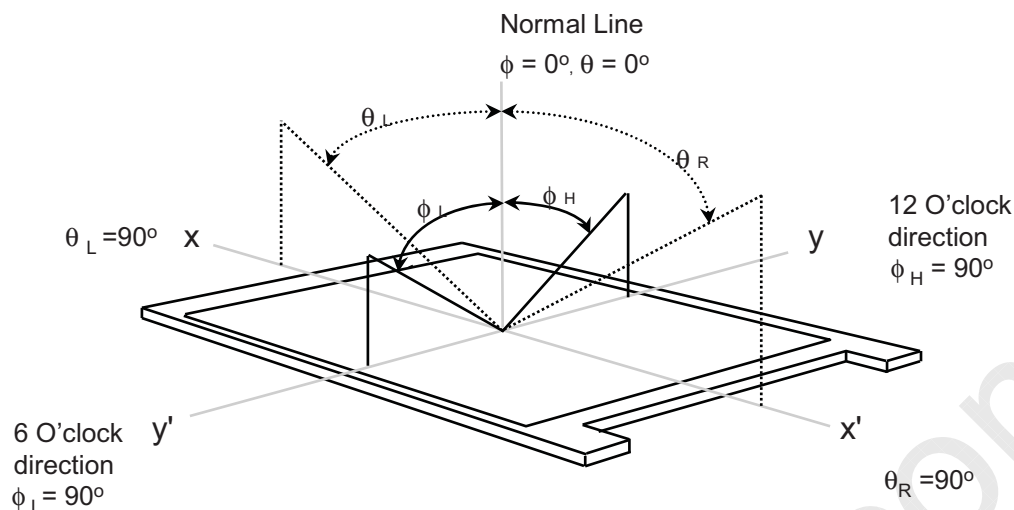Measuring equipment ： TOPCON SR3

* Ta = 25 $\pm$ 2 °C, V$_{DD}$=3.3V,   fv= 60Hz, f$_{DCLK}$ = 69.3MHz, IF = 13.0 mA

Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
Contrast Ratio (5 Points)		CR		300	TBD	-	-	(1), (2), (5)
Response Time at Ta (Rising + Falling)		T$_{RT}$		-	8	(12)	msec	(1), (3)
Average Luminance of White (5 Points)		Y$_{L,AVE}$		170	200	-	cd/m^2	IF=13.0mA (1), (4)
Color Chromaticity (CIE)	Red	R$_X$	Normal Viewing Angle $\phi = 0$ $\theta = 0$				-	(1), (5) PR-650
		R$_Y$						
	Green	G$_X$						
		G$_Y$						
	Blue	B$_X$						
		B$_Y$						
	White	W$_X$		0.283	0.313	0.343		
		W$_Y$		0.299	0.329	0.359		
Viewing Angle	Hor.	θ_L	CR $\geq$ 10 At center	40	45		Degrees	(1), (5) BM-5A
		θ_H		40	45			
	Ver.	ϕ_H		20	25			
		ϕ_L		25	30			
13 Points White Variation		δ_L		-	1.4	1.6	-	(6)

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	6 / 31

Approval

Note 1) Definition of Viewing Angle : Viewing angle range(10 ≤ C/R)

Normal Line
$\phi = 0°, \theta = 0°$

θ_L

θ_R

$\theta_L = 90°$ x

ϕ_L ϕ_H

y

12 O'clock direction
$\phi_H = 90°$

6 O'clock direction   y'
$\phi_L = 90°$

x'

$\theta_R = 90°$

Note 2) Definition of Contrast Ratio (CR) : Ratio of gray max (Gmax) ,gray min (Gmin) at 5 points(4, 5, 7, 9, 10)

$$CR = \frac{CR(4) + CR(5) + CR(7) + CR(9) + CR(10)}{5}$$

Points : ④ , ⑤ , ⑦ , ⑨ , ⑩ at the figure of Note (6).

Note 3) Definition of Response time :

Display data   White(TFT OFF)   Black(TFT ON)   White(TFT OFF)

T_R T_F

100%
90%

Optical Response

10%
0%

Time
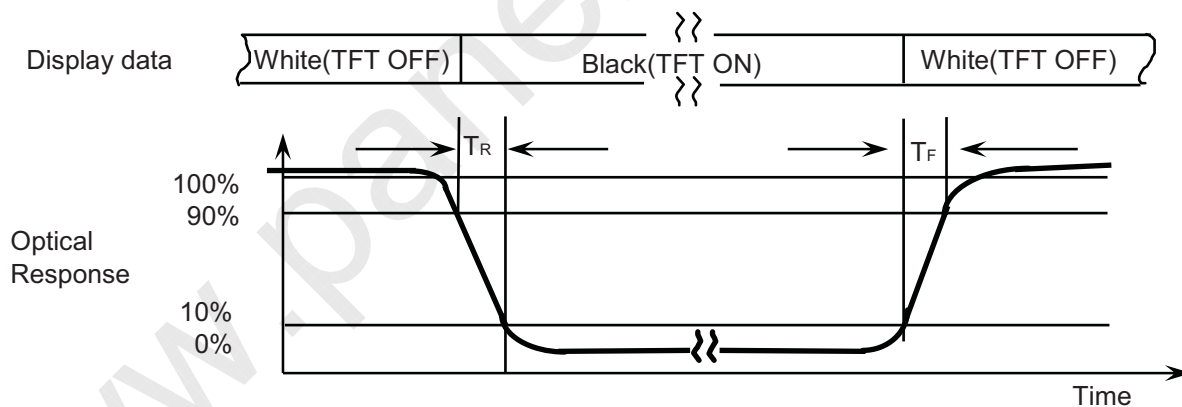
Note 4) Definition of Average Luminance of White : measure the luminance of white at 5 points.

320   640   960

VIEW AREA

Average Luminance of White ($Y_{L,AVE}$)

⑩   ⑨   200

⑦   400

$$Y_{L,AVE} = \frac{Y_{L4} + Y_{L5} + Y_{L7} + Y_{L9} + Y_{L10}}{5}$$

⑤   ④   600
(lines)

○ : test point
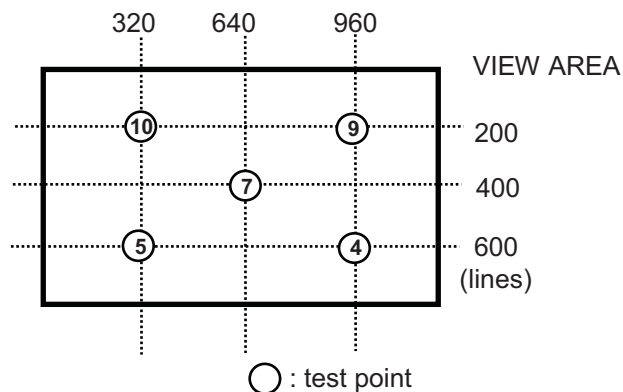
Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	7 / 31

Approval

Note 5) After stabilizing and leaving the panel alone at a given temperature for 30 min , the measurement
should be executed. Measurement should be executed in a stable, windless,and dark room.
30 min after lighting the backlight. This should be measured in the center of screen.
Lamp current : 6.0mA (Inverter : SIC-130T)
Environment condition : Ta = 25 ± 2 °C

Photo-detector
(TOPCON BM-5A
 PR-650)

Field = 2°

50 cm

TFT-LCD module

LCD panel

Center of the screen

[Optical characteristics measurement setup]

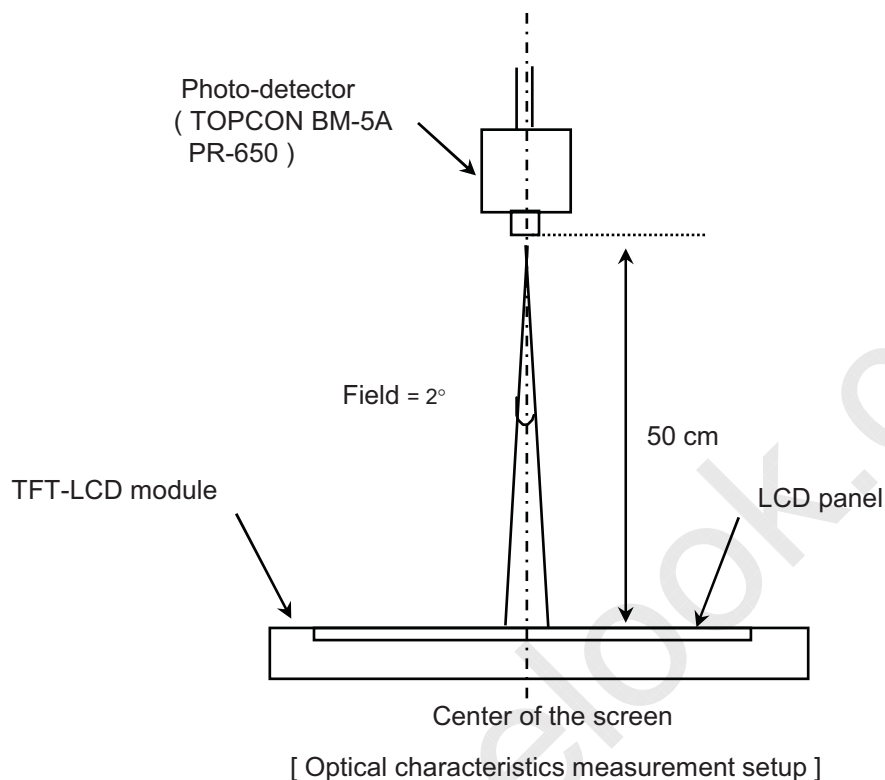Note 6) Definition of 13 points white variation (δ L), CR variation(C_{VER}) [① ~ ⑬]

$$\delta_L = \frac{\text{Maximum luminance of 13 points}}{\text{Minimum luminance of 13 points}}$$

10mm   320   640   960   10mm

10mm

13   12   11

10   9   200

8   7   6   400   ○ : test point

5   4   600
(lines)

3   2   1

10mm
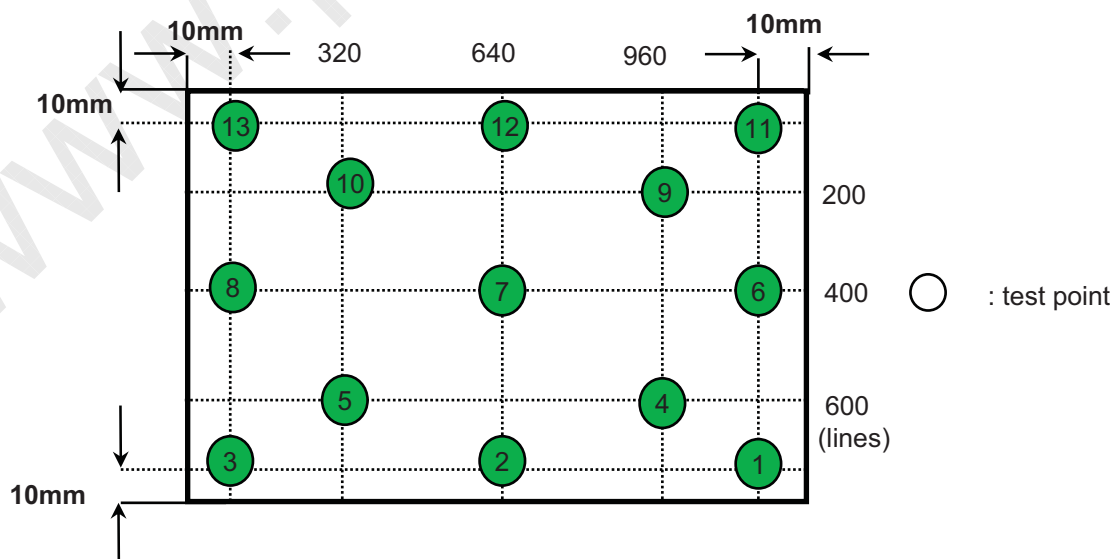
Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	8 / 31

3. ELECTRICAL CHARACTERISTICS

Approval

3.1 TFT LCD MODULE

Ta= 25 ± 2°C

Item		Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of Power Supply		V_{DD}	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold	High	V_{IH}	-	-	+100	mV	V_{CM} = +1.2V
	Low	V_{IL}	-100	-	-	mV	
Vsync Frequency		fv	-	60	-	Hz	
Hsync Frequency		f_H	-	48.96	-	KHz	
Main Frequency		f_{DCLK}	68.3	69.3	70.3	MHz	
Rush Current		I_{RUSH}	-	-	1.5	A	(4)
Current of Power Supply	White	I_{DD}	-	340	-	mA	(2),(3)*a
	Mosaic		-	370	-	mA	(2),(3)*b
	V. stripe		-	430	500	mA	(2),(3)*c

Note (1) Display data pins and timing signal pins should be connected.(GND = 0V)

(2) fv = 60Hz, f_{DCLK} = 69.3MHZ, V_{DD} = 3.3V , DC Current.

(3) Power dissipation pattern

*a) White Pattern   *b) Mosaic Pattern

VIEW AREA

Display Brightest Gray Level

Display Darkest Gray Level
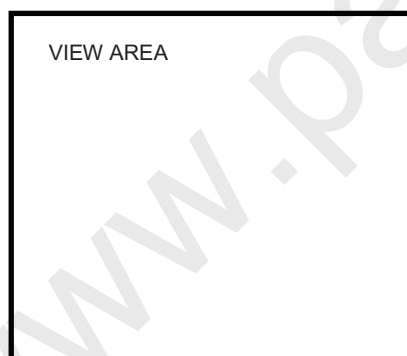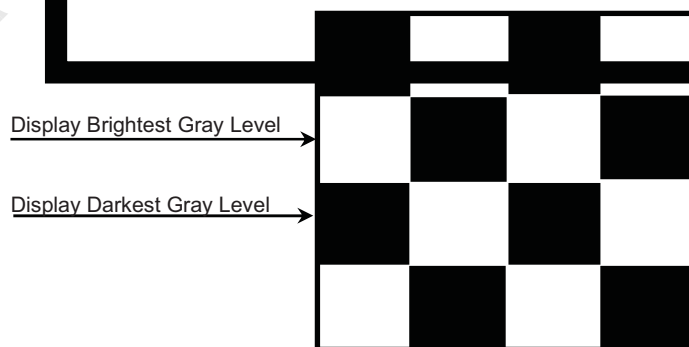
Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	9 / 31

Approval

*c) 1dot Vertical stripe pattern
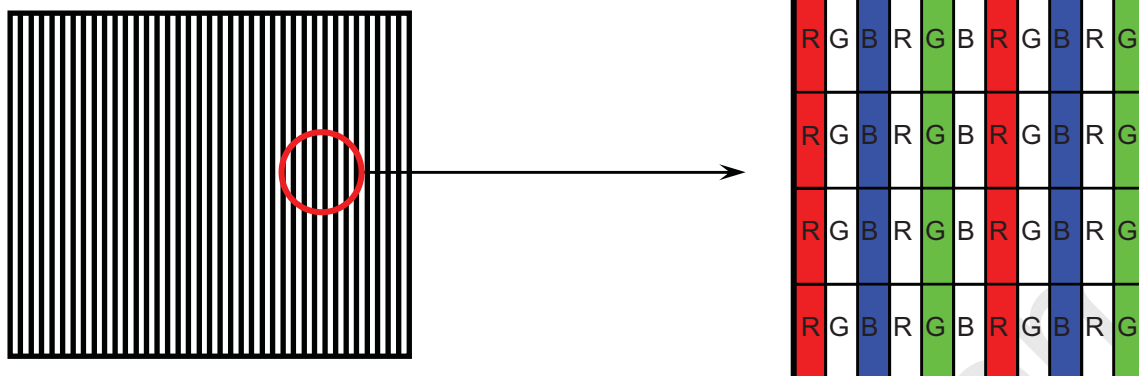
4) Rush current measurement condition

3.3V

M1
2SK1059

FUSE

C1
1uF

V_{DD} (LCD INPUT)

R1
47K

CONTROL SIGNAL
(HIGH to LOW)

R2
1K

M2
2SK1399

12V

R3
47K

C2
10000pF

C3
1uF

V_{DD} rising time is 470us

0.9V_{DD}

3.3V

0.1V_{DD}

GND
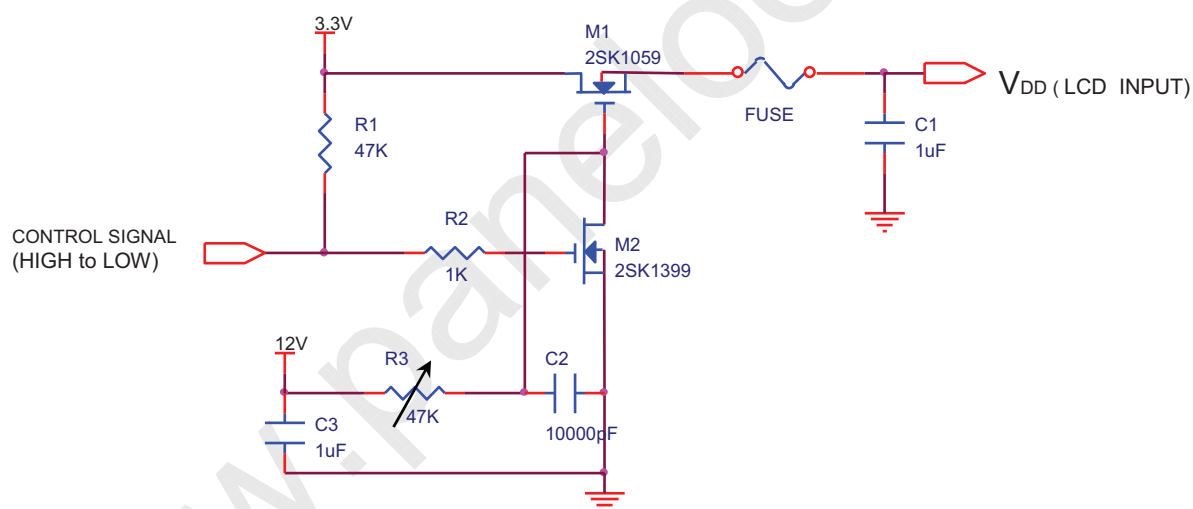
470us
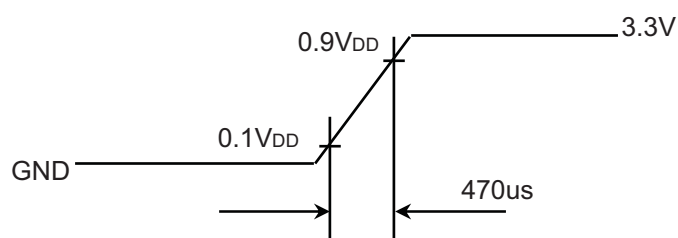
Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	10 / 31

Approval

3.2 BACK-LIGHT UNIT

Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Forward Current	IF	-	13	-	mA	
LED Forward Voltage	VF	-	3.2	-	V	
LED Array Voltage	VP	-	32	-	V	VF X 10 LEDs
Power Consumption	P	-	2.5	-	W	IF X VF X 60LEDs
Operating Life Time	Hr	12,000	-	-	Hour	(1)

Note (1) Life time (Hr) of LEDs can be defined as the time in which it continues to operate under the
condition Ta= 25 ± 2 °C and IF = 17.0 mArms until one of the following event occurs.
1. When the brightness becomes 50% or lower than the original.
2. When the Effective ignition length becomes 80% or lower than the original value.
(Effective ignition length is defined as an area that has less than 70% brightness compared to
the brightness in the center point.)

3.3 LED Driver

- On board LED Driver (Manufacturer : Intersil)　　　　　　　Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Input Voltage	V_{in}	7	12	20	V	
Input Current	I	-	260	-	mA	
Input Power	P_{in}	-	3.1	3.6	W	
Operating Frequency	F_o	1.1	1.2	1.3	MHz	
Burst Ratio	D	20	-	90	%	
External PWM Dimming Control Frequency (BLIM)	F_{BLIM}	0.2	-	20	kHz	Vin=8~21V, BLIM=PWM 0V~3.3V
Output Power	P_{out}	-	2.5	-	W	BLIM=100%
Efficiency	η	80	-	-	%	BLIM=100%

Note - Test Equipment : Fluke 45

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	11 / 31

Approval

4. BLOCK DIAGRAM

4.1 TFT LCD Module

Block diagram showing:

- **I²C bus** connecting to **EDID EEPROM**
- **Input Connector** *20347-340E-12 or Compatible*
- **LVDS Input/RSDS Output Timing Controller** (LVDS input, RSDS output)
- **DC-DC Converter**
- **Gamma Generator**
- **VCOM Generator**
- **Gate Pulse Generator**
- **LED Power Control**
- **LED B/L**
- **Source Driver IC**
- **SOURCE PCB**
- **14.1" WXGA (1280*3*800) TFT-LCD Panel**
- **Gate IC Integration**
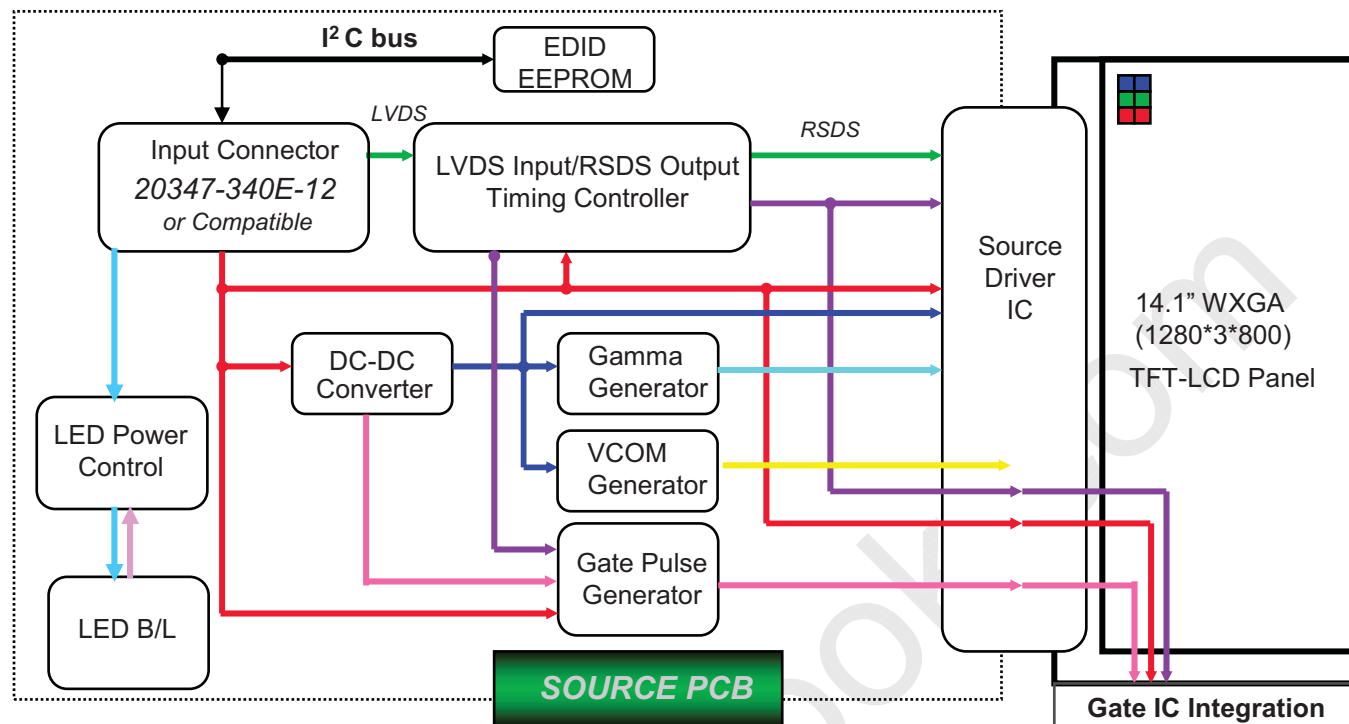
Legend:
- LED Power&signal
- Video Signal
- Control Signal
- VCOM
- Gamma
- DVDD
- AVDD
- Von/Voff
- Feedback

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	12 / 31

5. INPUT TERMINAL PIN ASSIGNMENT

Approval

5.1. Input Signal & Power (LVDS, Connector : 20347-340E-12 by I-PEX or equivalent)

No.	Signal	Description
1	NC	No Connection
2~3	AVDD	Power Supply, 3.3V (typical)
4	DVDD	DDC 3.3V power
5	NC	No Connection
6	SCL	DDC Clock
7	SDA	DDC Data
8	Rin0-	-LVDS differential data input (R0-R5, G0)
9	Rin0+	+LVDS differential data input (R0-R5, G0)
10	GND	Ground
11	Rin1-	-LVDS differential data input (G1-G5, B0-B1)
12	Rin1+	+LVDS differential data input (G1-G5, B0-B1)
13	GND	Ground
14	Rin2-	-LVDS differential data input (B2-B5, HS, VS, DE)
15	Rin2+	+LVDS differential data input (B2-B5, HS, VS, DE)
16	GND	Ground
17	ClkIN-	-LVDS differential clock input
18	ClkIN+	+LVDS differential clock input
19	GND	Ground
20~21	NC	No Connection
22	GND	Ground
23~24	NC	No Connection
25	GND	Ground
26~27	NC	No Connection
28	GND	Ground
29~30	NC	No Connection
31~33	VBL-	LED Ground
34	NC	No Connection
35	BLIM	PWM for luminance control (200~1KHz, 3.3V, 10~100%)
36	BL_Enable	BL On/Off (On:2.0~3.3V, Off: 0~0.5V)
37	NC	No Connection
38~40	VBL+	LED Power Supply 6V~20V

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	13 / 31

No.	Symbol	Function	Polarity	Remarks
31	VBL-	LED power return		
32	VBL-	LED power return		
33	VBL-	LED power return		
34	BLIM	PWM for luminance control		
35	NC	No Connection		
36	VBL+	7V – 20V LED power		
37	VBL+	7V – 20V LED power		
38	VBL+	7V – 20V LED power		
39	VBL+	7V – 20V LED power		
40	BIST/CT2	BIST / Connector Test		

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	14 / 31

Approval

5.2 LVDS Interface : Transmitter DS90CF363 or Compatible

Pin No.	Name	RGB Signal	Pin No.	Name	RGB Signal
51	TxIN0	R0	14	TxIN14	G5
52	TxIN1	R1	15	TxIN15	B0
54	TxIN2	R2	19	TxIN18	B1
55	TxIN3	R3	20	TxIN19	B2
56	TxIN4	R4	22	TxIN20	B3
3	TxIN6	R5	23	TxIN21	B4
4	TxIN7	G0	24	TxIN22	B5
6	TxIN8	G1	27	TxIN24	Hsync
7	TxIN9	G2	28	TxIN25	Vsync
11	TxIN12	G3	30	TxIN26	DE
12	TxIN13	G4	31	TxCLKIN	Clock

LVDS INTERFACE
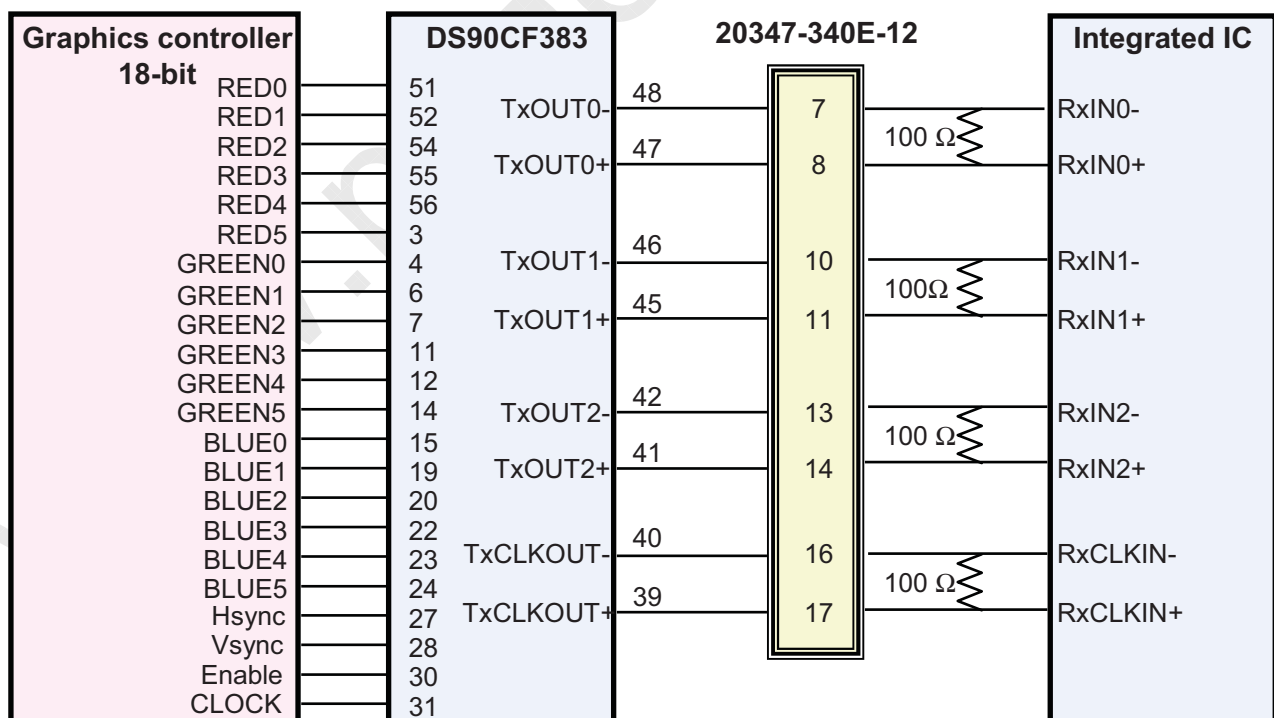
Note : The LCD Module uses a 100ohm resistor between positive and negative lines of each receiver input.

Samsung Secret

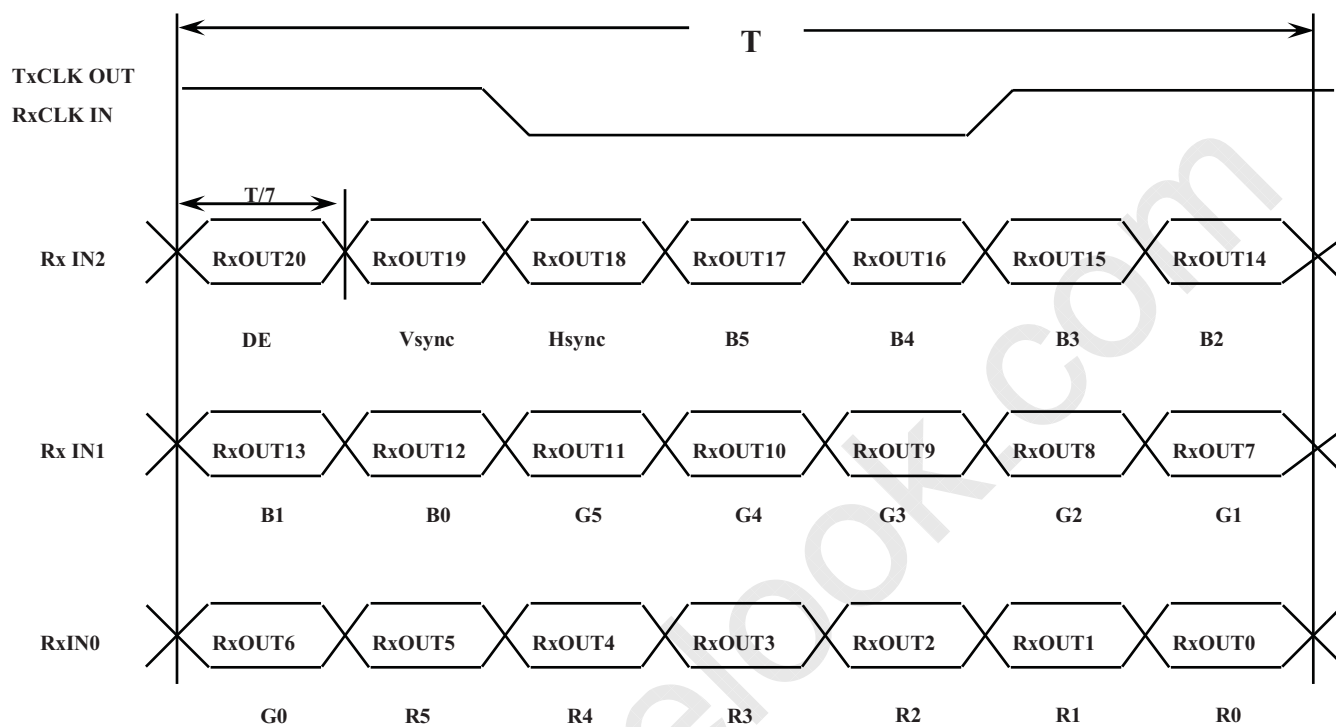| Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	15 / 31

Approval

5.3 Timing Diagrams of LVDS For Transmission

LVDS Receiver : Integrated T-CON

| Doc.No. | LTN141AT06 | Rev.No | 04-A00-G-080415 | Page | 16 / 31 |

Approval

5.4 Input Signals, Basic Display Colors and Gray Scale of Each Color

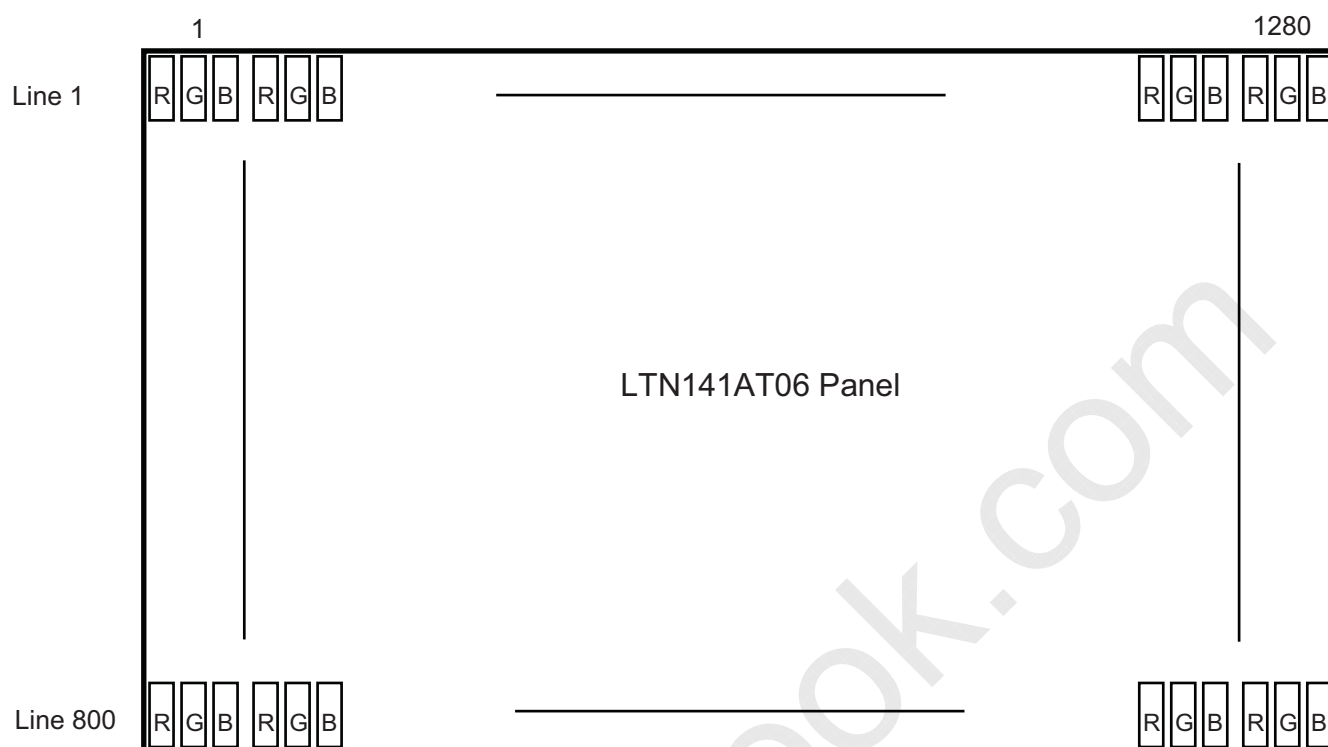| Color	Display	Red						Green						Blue						Gray Scale Level
		R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	45	B5	
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	-
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	-
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	-
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	-
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	-
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	-
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
Gray Scale Of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R0
	Dark	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R1
	↑	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	R3~R60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R61
	Light	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R62
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R63
Gray Scale Of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G0
	Dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	G1
	↑	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	G2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	G3~G60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	G61
	Light	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	G62
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	G63
Gray Scale Of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	B1
	↑	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	B3~B60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	B61
	Light	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	B62
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	B63

Note 1) Definition of gray :
    Rn: Red gray, Gn: Green gray, Bn: Blue gray (n=gray level)
Note 2)Input signal: 0 =Low level voltage, 1=High level voltage

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	17 / 31

Approval

5.5 Pixel Format in the display

1　　　　　　　　　　　　　　　　　　　　　　　1280

Line 1　R G B　R G B　　　　　　　　　　R G B　R G B

LTN141AT06 Panel

Line 800　R G B　R G B　　　　　　　　　R G B　R G B

Samsung Secret

| **Doc.No.** | LTN141AT06 | **Rev.No** | 04-A00-G-080415 | **Page** | 18 / 31 |

Approval

6. INTERFACE TIMING

6.1 Timing Parameters

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Frame Frequency	Cycle	TV	806	816	833	Lines	
Vertical Active Display Term	Display Period	TVD	-	800	-	Lines	
One Line Scanning Time	Cycle	TH	1320	1416	1500	Clocks	
Horizontal Active Display Term	Display Period	THD	-	1280	-	Clocks	

6.2 Timing diagrams of interface signal
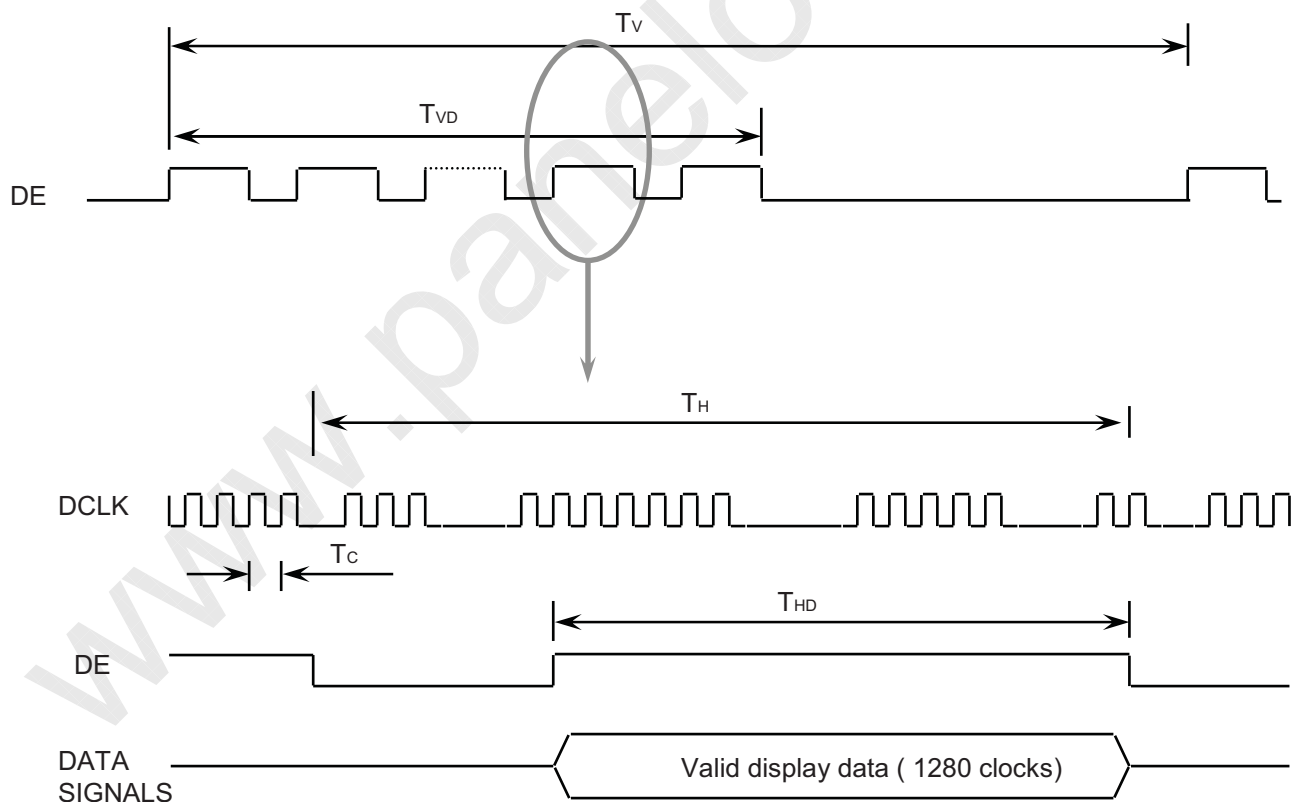
Samsung Secret

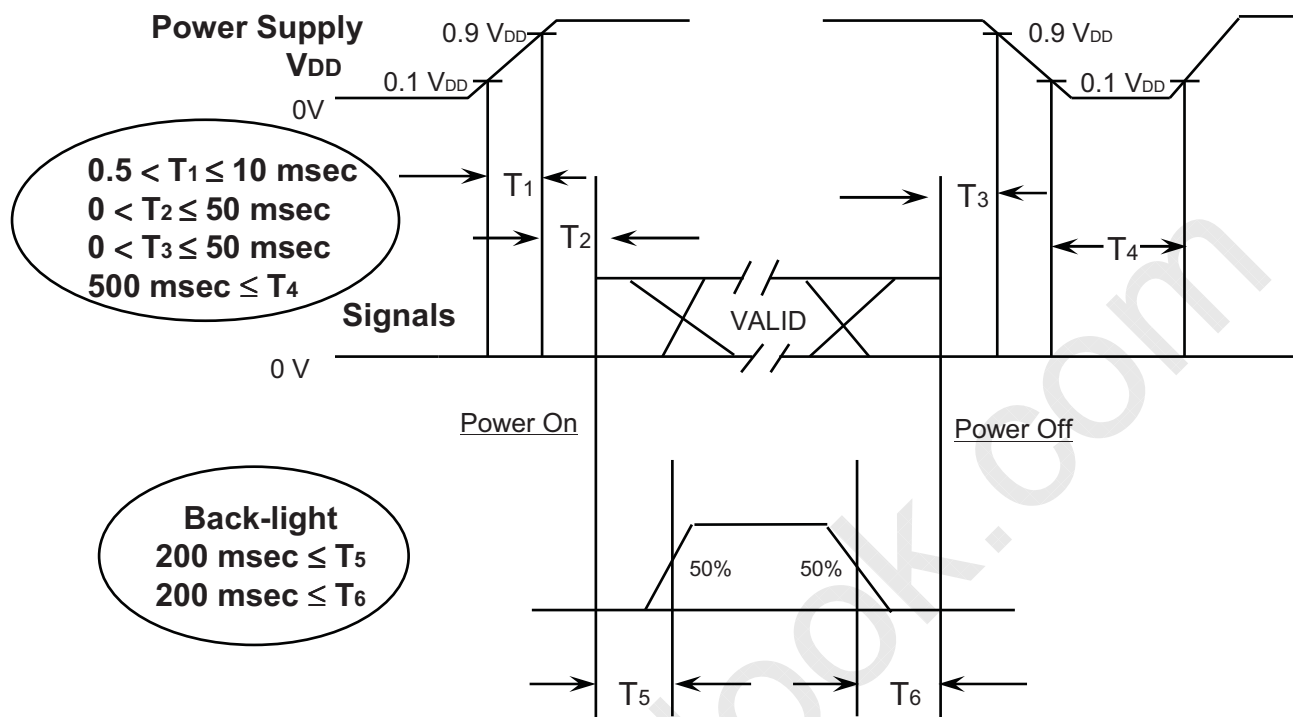| Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	19 / 31

6.3 Power ON/OFF Sequence

: To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.

Power Supply V$_{DD}$

0.9 V$_{DD}$

0.1 V$_{DD}$

0V

$0.5 < T_1 \leq 10$ msec
$0 < T_2 \leq 50$ msec
$0 < T_3 \leq 50$ msec
500 msec $\leq T_4$

0.9 V$_{DD}$

0.1 V$_{DD}$

T_1 T_3

T_2 T_4

Signals

VALID

0 V

Power On   Power Off

Back-light
200 msec $\leq T_5$
200 msec $\leq T_6$

50%   50%

T_5 T_6

Power ON/OFF Sequence

T1 : Vdd rising time from 10% to 90%
T2 : The time from Vdd to valid data at power ON.
T3 : The time from valid data off to Vdd off at power Off.
T4 : Vdd off time for Windows restart
T5 : The time from valid data to B/L enable at power ON.
T6 : The time from valid data off to B/L disable at power Off.

NOTE.

(1) The supply voltage of the external system for the module input should be the same as the definition of V$_{DD}$.

(2) Apply the lamp voltage within the LCD operation range. When the back-light turns on before the LCD operation or the LCD turns off before the back-light turns off, the display may momentarily become white.

(3) In case of V$_{DD}$ = off level, please keep the level of input signals on the low or keep a high impedance.

(4) T4 should be measured after the module has been fully discharged between power off and on period.

(5) Interface signal shall not be kept at high impedance when the power is on.

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	20 / 31

7. Mechanical Outline Dimension

Refer to the next page

Approval

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	21 / 31

Approval

This page will be replaced with the outline drawing after producing PDF file.

Samsung Secret

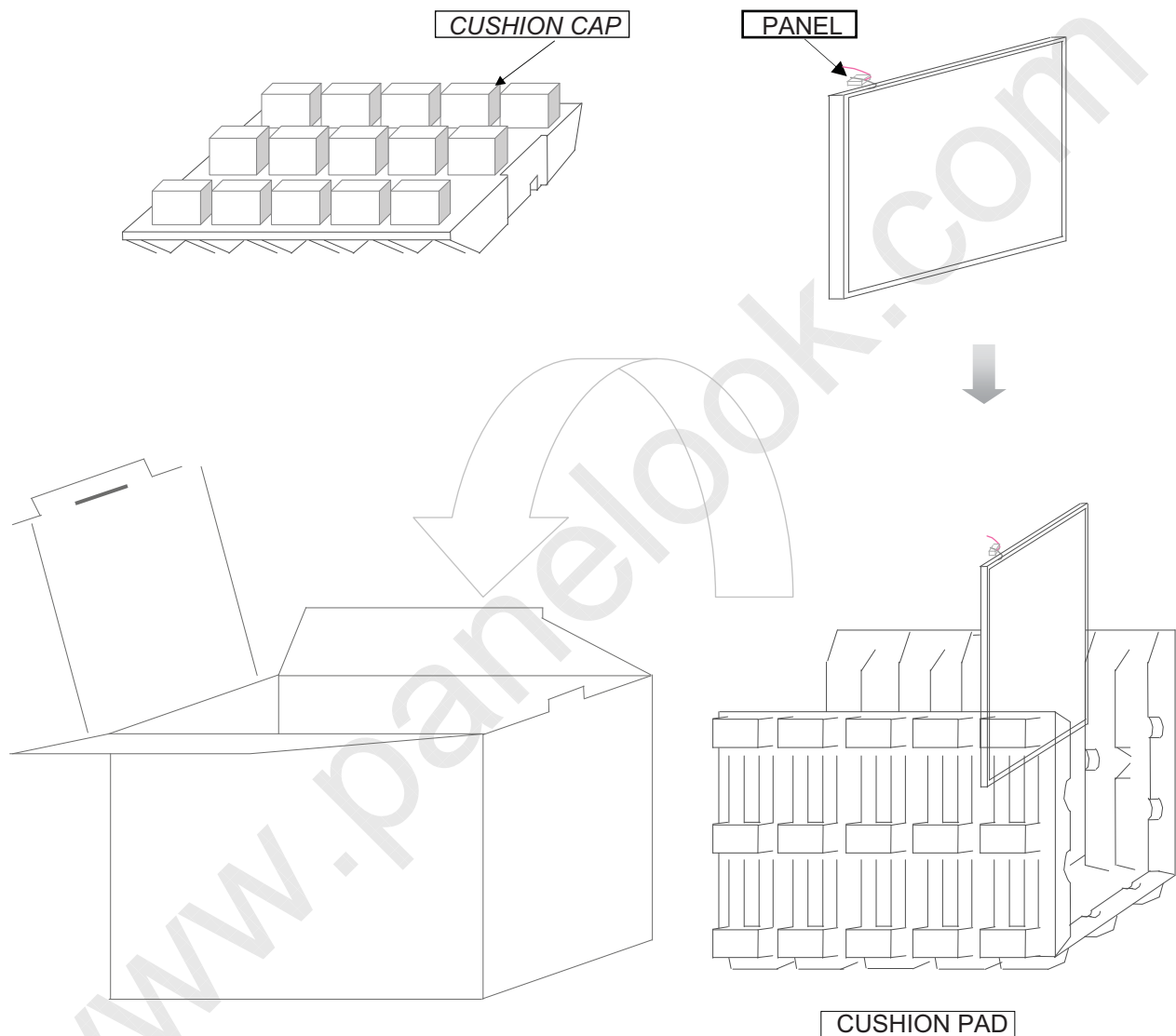| Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	22 / 31

8. PACKING

Approval

1. CARTON(Internal Package)

(1) Packing Form
   Corrugated Cardboard box and Corrupad form as shock absorber

(2) Packing Method

CUSHION CAP   PANEL

CUSHION PAD

Note (1) Total : Approx.   8.0Kg

(2) Acceptance number of piling : 10 sets

(3) Carton size : 408(W) X 325(D) X 295(H)

(4) MAX accumulation quantity : 5cartons

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	23 / 31

Approval

(3)Packing Material

| No	Part name	Quantity
1	Static electric protective sack	10
2	Packing case (Inner box) included shock absorber	1 set
3	Pictorial marking	2 pcs
4	Carton	1 set

9. MARKINGS & OTHERS

A nameplate bearing followed by is affixed to a shipped product at the specified location on each product.

(1)Parts number : LTN141AT06
(2)Revision   : Three letters
(3)Lot number   : X X X X XXX XX X   **001**

                                    Revision code
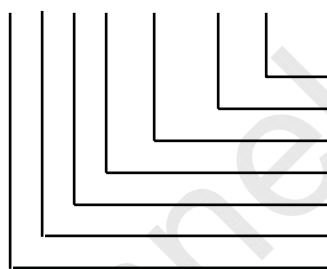
    Cell Position No.(In the one Glass)
    Glass No.(In the one Lot)
    Lot No.(Glass)
    Month
    Year(Note 1)
    Product Code
    Line

(4) Nameplate Indication

LTN141AT06

0742 |||||||||||||||||||||||||||||||||

XXXXXXXXXX   **001**

|||||||||||||||||||||||||||||||||

CT: XXXXXXXXXXXXXX

MADE IN KOREA

40 mm

80 mm
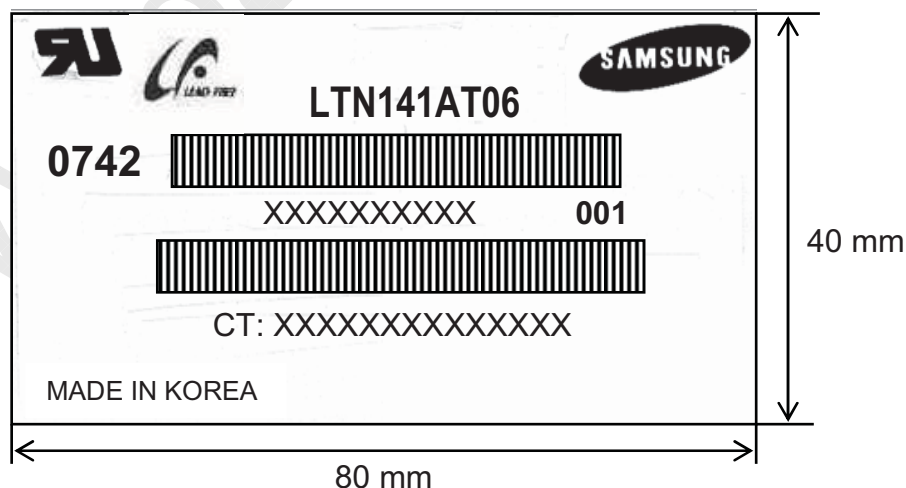
Parts name   : LTN141AT06
Lot number   : XXXXXXXXXX
Inspected work week : 0742 (2007 year 42th week)
Product Revision Code : **001**
CT code : XXXXXXXXXXXXXX (Released after HP's approval)

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	24 / 31

Approval

High voltage caution label

| ⚡ | HIGH VOLTAGE CAUTION
RISK OF ELECTRIC SHOCK DISCONNECT THE ELECTRIC POWER BEFORE SERVICE | THIS COVER CONTAINS FLUORESCENT LAMP. PLEASE FOLLOW LOCAL ORDINANCES OR REGULATIONS FOR ITS DISPOSAL |

10mm High voltage caution

70mm
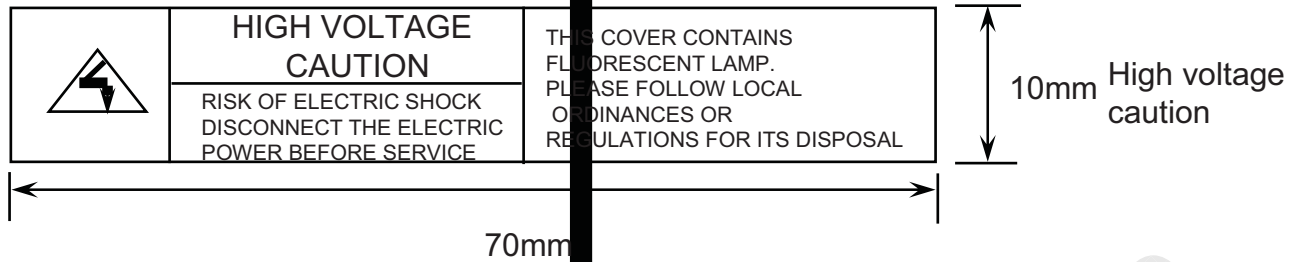
(5) Packing small box attach

DEVICE : LTN141AT06
TYPE   : 001   QTY : 010PCS

XXXXXXXXXX

HP PN : XXXXXX - XXX

MADE IN KOREA
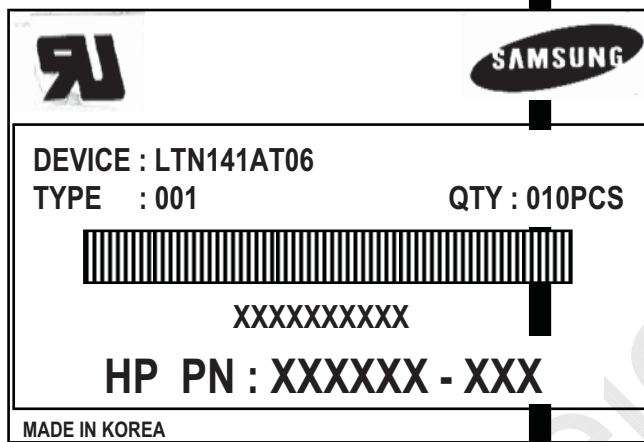
(6) Packing box Marking : Samsung TFT-LCD Brand Name

wise view™

Samsung Secret

| Doc.No. | LTN141AT06 | Rev.No | 04-A00-G-080415 | Page | 25 / 31 |

10. GENERAL PRECAUTIONS

Approval

1. Handling

　(a) When the module is assembled, It should be attached to the system firmly
　　　using every mounting holes. Be careful not to twist and bend the modules.

　(b) Refrain from strong mechanical shock and / or any force to the module. In addition to
　　　damage, this may cause improper operation or damage to the module and CCFT back-light.

　(c) Note that polarizers are very fragile and could be easily damaged. Do not press or scratch
　　　the surface harder than a HB pencil lead.

　(d) Wipe off water droplets or oil immediately. If you leave the droplets for a long time,
　　　Staining and discoloration may occur.

　(e) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

　(f) The desirable cleaners are water, IPA (Isoprophyl Alcohol) or Hexane.
　　　Do not use Ketone type materials(ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl
　　　chloride. It might permanent damage to the polarizer due to chemical reaction.

　(g) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or
　　　mouth . In case of contact with hands, legs or clothes, it must be washed away thoroughly
　　　with soap.

　(h) Protect the module from static , it may cause damage to the C-MOS Gate Array IC.

　(i) Use fingerstalls with soft gloves in order to keep display clean during the incoming
　　　inspection and assembly process.

　(j) Do not disassemble the module.

　(k) Do not pull or fold the lamp wire.

　(l) Do not adjust the variable resistor which is located on the back side.

　(m) Protection film for polarizer on the module shall be slowly peeled off just before use so
　　　that the electrostatic charge can be minimized.

　(n) Pins of I/F connector shall not be touched directly with bare hands.

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	26 / 31

2. STORAGE

(a) Do not leave the module in high temperature, and high humidity for a long time.
　　 It is highly recommended to store the module with temperature from 0 to 35 °C and
　　 relative humidity of less than 70%.

(b) Do not store the TFT-LCD module in direct sunlight.

(c) The module shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent
　　 light during the store.

3. OPERATION

(a) Do not connect,disconnect the module in the " Power On" condition.

(b) Power supply should always be turned on/off by following item 6.3
　　 " Power on/off sequence ".

(c) Module has high frequency circuits. Sufficient suppression to the electromagnetic
　　 interference shall be done by system manufacturers. Grounding and shielding methods
　　 may be important to minimize the interference.

(d) The cable between the back-light connector and its inverter power supply shall be a
　　 minimized length and be connected directly . The longer cable between the back-light
　　 and the inverter may cause lower luminance of lamp(CCFT) and may require higher
　　 startup voltage (Vs).

(e) The standard limited warranty is only applicable when the module is used for general
　　 notebook applications. If used for purposes other than as specified, SEC is not to be
　　 held reliable for the defective operations. It is strongly recommended to contact SEC
　　 to find out fitness for a particular purpose.

4. OTHERS

(a) Ultra-violet ray filter is necessary for outdoor operation.

(b) Avoid condensation of water. It may result in improper operation or disconnection
　　 of electrode.

(c) Do not exceed the absolute maximum rating value. (the supply voltage variation, input
　　 voltage variation, variation in part contents and environmental temperature, so on)
　　 Otherwise the module may be damaged.

(d) If the module displays the same pattern continuously for a long period of time,it can be
　　 the situation when the image "sticks" to the screen.

(e) This module has its circuitry PCB's on the rear side and should be handled carefully in
　　 order not to be stressed.

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	27 / 31

11. EDID

Approval

Address (HEX)	FUNCTION	Value HEX	BIN	DEC	ASCII or Data	Notes
00	Header	00	00000000	0		EDID Header
01		FF	11111111	255		
02		FF	11111111	255		
03		FF	11111111	255		
04		FF	11111111	255		
05		FF	11111111	255		
06		FF	11111111	255		
07		00	00000000	0		
08	ID Manufacturer Name	4C	01001100	76	S	3 character ID
					E	
09		A3	10100011	163	C	"SEC"
0A	ID Product Code	42	01000010	66	[B]	
0B		4E	01001110	78	[N]	
0C	32-bit serial no.	00	00000000	0		
0D		00	00000000	0		
0E		00	00000000	0		
0F		00	00000000	0		
10	Week of manufacture	00	00000000	0		
11	Year of manufacture	12	00010010	18	2008	2008
12	EDID Structure Ver.	01	00000001	1	1	EDID Ver. 1.0
13	EDID revision #	03	00000011	3	3	EDID Rev. 3
14	Video input definition	80	10000000	128		
15	Max H image size	1E	00011110	30	30	30 cm(approx)
16	Max V image size	13	00010011	19	19	19 cm(approx)
17	Display Gamma	78	01111000	120	2.2	Gamma 2.2
18	Feature support	0A	00001010	10		
19	Red/green low bits	87	10000111	135		10000111
1A	Blue/white low bits	F5	11110101	245		11111110
1B	Red x/ high bits	94	10010100	148	0.580	Red x 0.580= 1001010010
1C	Red y	57	01010111	87	0.340	Red y 0.340= 0101011100
1D	Green x	4F	01001111	79	0.310	Green x 0.310= 0100111101
1E	Green y	8C	10001100	140	0.550	Green y 0.550= 1000110011
1F	Blue x	27	00100111	39	0.155	Blue x 0.155= 001001111
20	Blue y	27	00100111	39	0.155	Blue y 0.155= 001001111
21	White x	50	01010000	80	0.313	White x 0.313= 0101000001
22	White y	54	01010100	84	0.329	White y 0.329= 0101010001
23	Established timing 1	00	00000000	0		
24	Established timing 2	00	00000000	0		
25	Established timing 3	00	00000000	0		

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	28 / 31

Approval

26	Standard timing #1	01	00000001	1		not used	
27		01	00000001	1			
28	Standard timing #2	01	00000001	1		not used	
29		01	00000001	1			
2A	Standard timing #3	01	00000001	1		not used	
2B		01	00000001	1			
2C	Standard timing #4	01	00000001	1		not used	
2D		01	00000001	1			
2E	Standard timing #5	01	00000001	1		not used	
2F		01	00000001	1			
30	Standard timing #6	01	00000001	1		not used	
31		01	00000001	1			
32	Standard timing #7	01	00000001	1		not used	
33		01	00000001	1			
34	Standard timing #8	01	00000001	1		not used	
35		01	00000001	1			
36	Detailed timing/monitor descriptor #1	14	00010100	20	69.32	Main clock= 69.32 MHz	
37		1B	00011011	27			
38		00	00000000	0	1280	Hor active=640*2 pixels	
39		88	10001000	136	136	Hor blanking=136 pixels	
3A		50	01010000	80		4bit : 4bit	
3B		20	00100000	32	800	Vertcal active=800 lines	
3C		10	00010000	16	16	Vertical blanking=16 lines	
3D		30	00110000	48		4bit : 4bit	
3E		0C	00001100	12	12	Hor sync. Offset=12 pixels	
3F		40	01000000	64	64	H sync. Width=64 pixels	
40		33	00110011	51	3	V sync. Offset=3 lines	
					3	V sync. Width=3 lines	
41		00	00000000	0		2bit : 2bit :2bit :2bit	
42		2F	00101111	47	303	H image size= 303 mm(approx)	
43		BE	10111110	190	190	V image size = 190 mm(approx)	
44		10	00010000	16			
45		00	00000000	0		No Horizontal Border	
46		00	00000000	0		No Vertical Border	
47		19	00011001	25			
48	Detailed timing/monitor descriptor #2	00	00000000	0		Manufacturer Specified (Timing)	
49		00	00000000	0			
4A		00	00000000	0			
4B		0F	00001111	15			
4C		00	00000000	0			
4D		00	00000000	0		**Value**=HSPWmin / 2	
4E		00	00000000	0		**Value**=HSPWmax / 2	
4F		00	00000000	0		**Value**=Thbpmin /2	
50		00	00000000	0		**Value**=Thbpmax /2	
51		00	00000000	0		**Value**=VSPWmin /2	
52		00	00000000	0		**Value**=VSPWmax /2	
53		00	00000000	0		**Value**=Tvbpmin / 2	
54		00	00000000	0		**Value**=Tvbpmax / 2	
55		23	00100011	35		Thpmin=**value***2 + HA pixelclks	
56		87	10000111	135		Thpmax=**value***2 + HA pixelclks	
57		02	00000010	2		Tvpmin=**value***2 + VA lines	
58		64	01100100	100		Tvpmax=**value***2 + VA lines	
59		00	00000000	0		Module revision	

Samsung Secret

Doc.No.	LTN141AT06	Rev.No	04-A00-G-080415	Page	29 / 31

Approval

5A		00	00000000	0		
5B		00	00000000	0		
5C		00	00000000	0		ASCII Data String Tag
5D		FE	11111110	254		
5E		00	00000000	0		
5F		53	01010011	83	[S]	
60		41	01000001	65	[A]	
61	Detailed timing/monitor	4D	01001101	77	[M]	
62	descriptor #3	53	01010011	83	[S]	
63		55	01010101	85	[U]	
64		4E	01001110	78	[N]	
65		47	01000111	71	[G]	
66		0A	00001010	10	[^]	
67		20	00100000	32	[ ]	
68		20	00100000	32	[ ]	
69		20	00100000	32	[ ]	
6A		20	00100000	32	[ ]	
6B		20	00100000	32	[ ]	
6C		00	00000000	0		
6D		00	00000000	0		
6E		00	00000000	0		Monitor Name Tag (ASCII)
6F		FE	11111110	254		
70		00	00000000	0		
71		31	00110001	49	[1]	
72		34	00110100	52	[4]	
73	Detailed timing/monitor	31	00110001	49	[1]	
74	descriptor #4	41	01000001	65	[A]	
75		54	01010100	84	[T]	
76		30	00110000	48	[0]	
77		36	00110110	54	[6]	
78		2D	00101101	45	[-]	
79		30	00110000	48	[0]	
7A		30	00110000	48	[0]	
7B		31	00110001	49	[1]	
7C		0A	00001010	10	[^]	
7D		20	00100000	32	[ ]	
7E	Extension Flag	00	00000000	0		
7F	Checksum	A2	10100010	162		

Samsung Secret